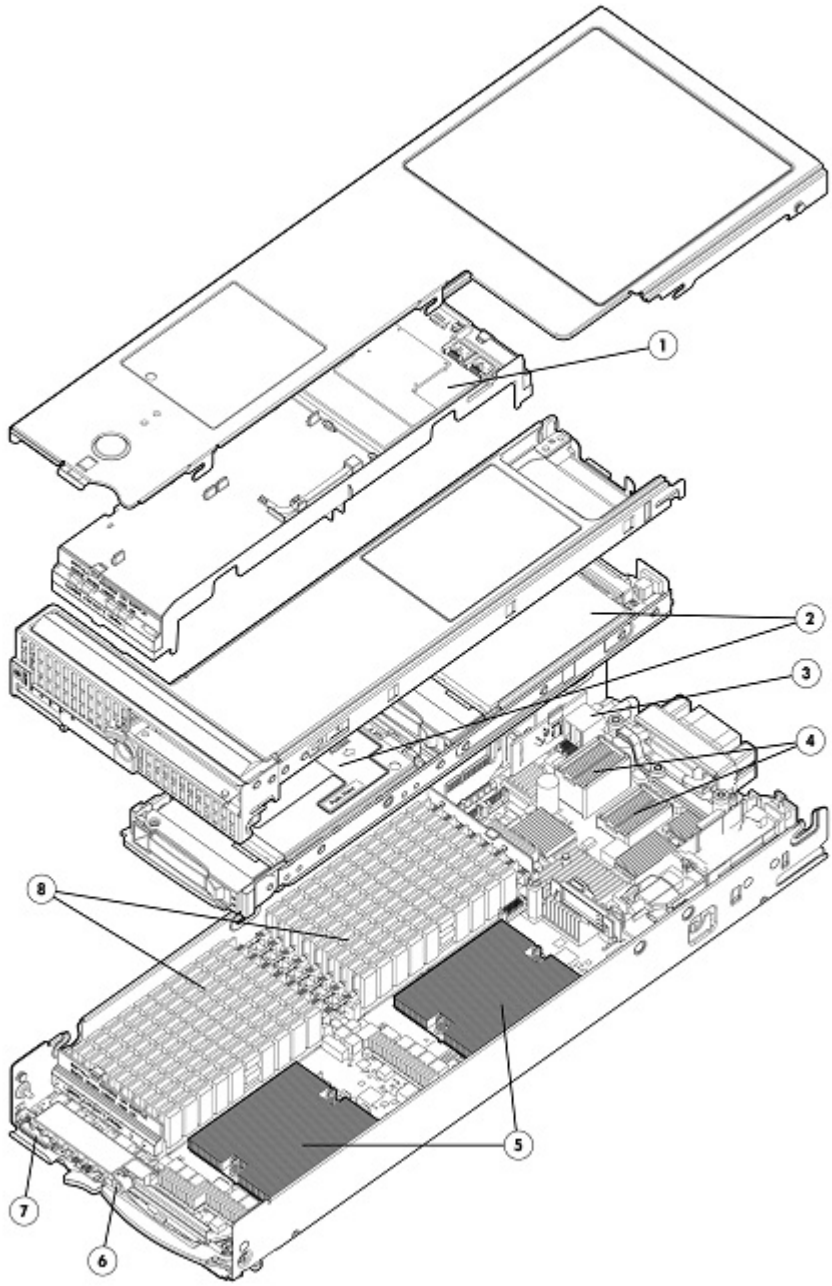
*Overview*




HP ProLiant BL465c G7 Server Blade

1. Smart Array P410i storage controller (available as an option in factory integrated models)
2. Two (2) small form factor (SFF) hot plug drive bays
3. Internal USB connector
   Internal MicroSD card slot
5. Up to two (2) Multi-Core AMD Opteron™ 6100 Series processors
6. System power button and LED
7. Local I/O connector

4. Two (2) mezzanine I/O expansion slots
8. Sixteen (16) PC3-8500 DDR3 Registered DIMMs, PC3-10600 DDR3 Registered DIMMs, or PC3-10600 DDR3 Unbuffered DIMMs

## What's New

- Support for AMD Opteron™ 6204 Processors
- Support for DDR3-1600 (PC3-12800R) Registered 4GB, 8GB Single Rank, and 16GB Dual Rank Memory

## At A Glance

This document covers the HP ProLiant BL465c G7 server blade only. For more information on HP BladeSystem c-Class Enclosures and HP BladeSystem c-Class Interconnect and Mezzanine Components, please see the following QuickSpecs:

- HP BladeSystem c3000 Enclosure QuickSpecs:
  http://h18000.www1.hp.com/products/quickspecs/12790_na/12790_na.html
- HP BladeSystem c7000 Enclosure QuickSpecs:
  http://h18000.www1.hp.com/products/quickspecs/12810_na/12810_na.html
- HP BladeSystem c-Class Interconnect and Mezzanine Components:
  http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html
  http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html

The BL465c G7 helps simplify network connections, lower infrastructure costs, and delivers the performance you expect for demanding application workloads.

HP ProLiant BL465c G7 server blade includes:

- Processor:
  - Up to two (2) Multi-Core AMD Opteron™ 6200 or 6100 Series processors
    - Sixteen-Core supports up to 2.3 GHz; 8x2MB Level 2 cache; 16 MB Level 3 cache
    - Twelve-Core supports up to 2.6 GHz; 6x2MB Level 2 cache; 16 MB Level 3 cache
    - Eight-Core supports up to 3.0 GHz; 4x2MB Level 2 cache; 16 MB Level 3 cache
    - Four-Core supports up to 3.3 GHz, 2x2MB Level 2 cache; 16MB Level 3 cache
  - AMD SR5690 and SP5100 chipsets
- Memory:
  - Sixteen (16) DIMM slots
  - Up to 512GB of PC3L-10600 DDR3 Registered (RDIMM) memory, operating at 1066 MHz when fully populated at 2 DIMMs per channel in 16 slots
  - Up to 256GB of PC3-10600 DDR3 Registered (RDIMM) memory, operating at 1333 MHz when fully populated at 2 DIMMs per channel in 16 slots
  - Up to 256GB of PC3-12800 DDR3 Registered (RDIMM) memory, operating at 1600 MHz when fully populated at 2 DIMMs per channel in 16 slots
  - Up to 64GB of PC3-10600 DDR3 Unbuffered (UDIMM) memory, operating at 1333 MHz when fully populated at 2 DIMMs per channel in 16 slots
  - Supporting memory interleaving (2:1)

    NOTE: Each processor memory bus will operate at up to 1600 MHz with two single-rank or dual-rank (SR/DR) DIMMs per processor memory channel, up to 1333 MHz with either one quad-rank (QR) or two single-rank/dual-rank (SR/DR) DIMMs per processor memory channel, and 1066 MHz with up to two QR or one QR and one SR/DR DIMMs per processor memory channel with standard voltage (1.5V, PC3) DIMMs. Memory bus will operate one speed slower when low voltage (1.35V, PC3L) memory is installed. Memory bus speeds may be further limited by the speed of the memory used as well.

*Overview*

- Storage Controller:
  - Smart Array P410i RAID controller with 1 GB flash-backed write cache (FBWC). Supports RAID 0,1.
    NOTE: The HP Smart Array P410i controller is required for all blades that support hot plug drives. See Factory Integrated Models section for more information.
- Internal Drive Support:
  - Up to two (2) small form factor (SFF) SAS or SATA hot plug hard disk drives or SATA solid state drives
    NOTE: SAS, SATA, and/or SSD drives cannot be mixed within the server.
- Network Controller:
  - One (1) integrated NC551i Dual Port FlexFabric 10Gb Converged Network Adapter supporting stateless TCP/IP offload, TCP Offload Engine (TOE), Fibre Channel over Ethernet (FCoE) and iSCSI protocols
    NOTE: Flex-10 capability requires the use of an HP Virtual Connect Flex-10 10Gb Ethernet module. Learn more at: www.hp.com/go/virtualconnect
    NOTE: Fibre Channel over Ethernet (FCoE) capability requires the use of an HP Virtual Connect FlexFabric 10GB/24-port Module or HP 10GbE Pass-Thru Module.
    NOTE: Each port is autosensing 1 Gb / 10 Gb, and can interoperate with 1 Gb HP BladeSystem c-Class interconnect components. Both ports will operate at the same speed.
  - One (1) additional embedded 10/100 network adapter dedicated to iLO 3 management
- Mezzanine Support:
  - Two (2) I/O expansion mezzanine slots
  - Supports up to two (2) mezzanine cards
    - Dual-Port FlexFabric Adapter mezzanine option
    - Dual-Port Fibre Channel Mezzanine (4-Gb or 8-Gb) options for SAN connectivity
    - Dual-Port FlexFabric Converged Network Adapter
    - Ethernet server adapter mezzanine options for additional network ports
    - InfiniBand (IB) Mezzanine options for low latency server interconnectivity
    - I/O Accelerator mezzanine options for high transaction rate local storage
    - SAS mezzanine option for external direct attach and shared SAS storage
- Expansion Blade Support:
  - Supports one (1) optional storage, tape, or PCI expansion blade
- Internal Media Support:
  - One (1) internal USB 2.0 connector for security key devices and USB drive key
  - One (1) internal Micro SD-HC card slot
- Trusted Platform Module:
  - One (1) internal TPM 1.2 module connector
- Form Factor:
  - HP ProLiant BL465c G7 server blade plugs into the BladeSystem c3000 and c7000 enclosures
- Infrastructure Management:
  - This server blade requires the latest version of the Onboard Administrator firmware. This firmware release may also require other subsystem firmware upgrades. For information on the latest firmware versions, please see the Blades Firmware Maintenance website at http://h18004.www1.hp.com/products/blades/components/c-class-compmatrix.html
  - HP Integrated Lights-Out 3 management processor for simplified server setup, health monitoring and recovery, power and thermal control, and lights-out remote administration.
  - HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, control and optimize your IT infrastructure through a single, simple management console. Insight Control supports both Windows and Linux-based central management servers.
  - HP Insight Dynamics for ProLiant, a product option, is an integrated command center that enables IT Staff personnel to continuously analyze and optimize a converged infrastructure, while automating and reducing the cost of common data center tasks by as much as 40 percent. This ultimately enables them to dynamically keep pace with the organization's changing business requirements.
- Operating Systems and Virtualization Software:
  - Supports Windows, RHEL, SLES, VMware, Oracle Solaris, Oracle Linux Unbreakable Enterprise Kernel, and Citrix

*Overview*

XenServer

- Enclosures:
  - HP offers two (2) different c-Class server blade enclosures to meet your individual needs:
    - The HP BladeSystem c7000 rack enclosure is 10U high and holds up to sixteen (16) ProLiant BL465c G7 servers plugged vertically.
    - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to eight (8) HP ProLiant BL465c G7 servers plugged horizontally.
  - Server blades, storage blades, and interconnect modules are all designed to fit into the c7000 and c3000 enclosures.
  - For additional enclosure information, please see: http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/index.html.
    NOTE: For optimal cooling and system performance the BL465c G7 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans.
- Warranty:
  - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to specific hard drive QuickSpecs for details.
    NOTE: Server warranty includes 3-year Parts, 3- year Labor, 3-year on-site support. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

*Standard Features*

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

| | |
|---|---|
| **Processor**<br>One of the following depending on Model | **Sixteen-Core Processors**<br>AMD Opteron™ 6276 (2.30GHz/16-core/16MB/115W) Processor<br>AMD Opteron™ 6274 (2.20GHz/16-core/16MB/115W) Processor<br>AMD Opteron™ 6272 (2.10GHz/16-core/16MB/115W) Processor<br>Low Power AMD Opteron™ 6262HE (1.60GHz/16-core/16MB/85W) Processor<br>**Twelve-Core Processors**<br>AMD Opteron™ 6238 (2.60GHz/12-core/16MB/115W) Processor<br>AMD Opteron™ 6234 (2.40GHz/12-core/16MB/115W) Processor<br>AMD Opteron™ 6176 (2.3GHz/12-core/12MB/115W) Processor<br>AMD Opteron™ 6174 (2.2GHz/12-core/12MB/115W) Processor<br>AMD Opteron™ 6172 (2.1GHz/12-core/12MB/115W) Processor<br>Low Power AMD Opteron™ Model 6166HE (1.8GHz/12-core/12MB/85W) Processor<br>Low Power AMD Opteron™ Model 6164 HE (1.7GHz/12-core/12MB/85W) Processor<br>**Eight-Core Processors**<br>AMD Opteron™ 6220 (3.0GHz/8-core/16MB/115W) Processor<br>AMD Opteron™ 6212 (2.60GHz/8-core/16MB/115W) Processor<br>AMD Opteron™ 6140 (2.6GHz/8-core/12MB/115W) Processor<br>AMD Opteron™ 6136 (2.4GHz/8-core/12MB/115W) Processor<br>AMD Opteron™ 6134 (2.3GHz/8-core/12MB/115W) Processor<br>Low Power AMD Opteron™ 6132HE (2.2GHz/8-core/12MB/85W) Processor<br>Low Power AMD Opteron™ 6128HE (2.0GHz/8-core/12MB/85W) Processor<br>**Four-Core Processors**<br>AMD Opteron™ 6204 (3.3GHz/4-core/16MB/115W) Processor<br>NOTE: Processor wattage references reflect Thermal Design Power (TDP). For more information on TDP and Average CPU Power (ACP) visit: http://www.amd.com/acp. |
| **Upgradeability** | Upgradeable to dual (2) processors |
| **Cache Memory**<br>One of the following depending on Model | 6200 Series: 8 x 2MB Level 2 cache memory; 16 MB Lever 3 cache memory<br>6100 Series: 512 KB Level 2 cache memory per core; 12 MB Level 3 cache memory |
| **Chipset** | AMD SR5690 and SP5100 |

*Standard Features*

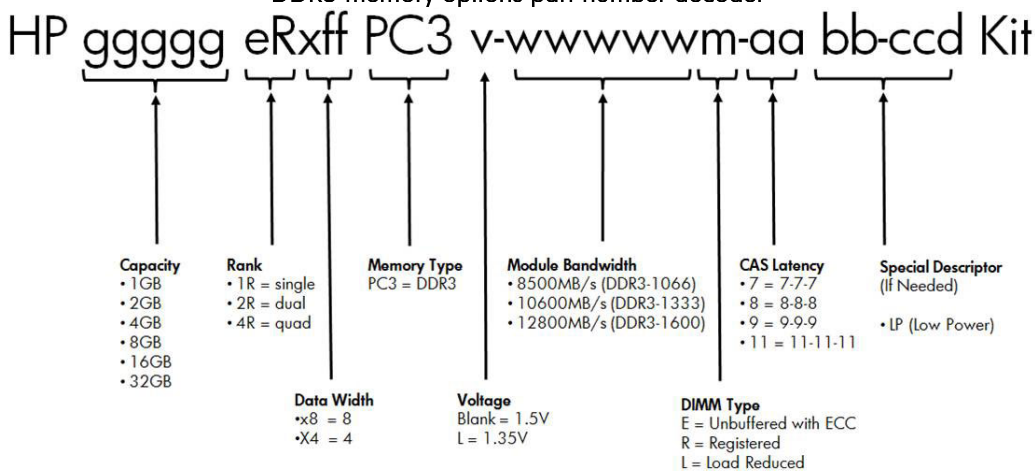
**Memory**

| | |
|---|---|
| Type | DDR3 Registered (RDIMM) or Unbuffered (UDIMM) |
| Standard | 8 GB (2 x 4 GB) |
| Maximum (RDIMM) | 512 GB (16 x 32 GB) at 1333 MHz |
| Maximum (UDIMM) | 64 GB (16 x 4 GB) at 1333 MHz |

NOTE: Each processor memory bus will operate at up to 1600 MHz with two single-rank or dual-rank (SR/DR) DIMMs per processor memory channel, up to 1333 MHz with either one quad-rank (QR) or two single-rank/dual-rank (SR/DR) DIMMs per processor memory channel, and 1066 MHz with up to two QR or one QR and one SR/DR DIMMs per processor memory channel with standard voltage (1.5V, PC3) DIMMs. Memory bus will operate one speed slower when low voltage (1.35V, PC3L) memory is installed. Memory bus speeds may be further limited by the speed of the memory used as well. Please see the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.

NOTE: Kits described as PC3L include Low Voltage DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/ddr3memory-configurator

DDR3 memory options part number decoder




**Network Controller**

One (1) integrated NC551i Dual Port FlexFabric 10Gb Converged Network Adapter
NOTE: Flex-10 capability requires the use of an HP Virtual Connect Flex-10 10Gb Ethernet module. Learn more at: www.hp.com/go/virtualconnect.
NOTE: Fibre Channel over Ethernet (FCoE) capability requires the use of an HP Virtual Connect FlexFabric 10GB/24-port Module or HP 10GbE Pass-Thru Module.
One (1) additional 10/100 network adapter dedicated to iLO 3 Management

**I/O Expansion Slots**

Two (2) I/O expansion mezzanine slots (All x8 PCI Express)

**Integrated Manageability**

HP Integrated Lights-Out 3

*Standard Features*

| | | |
|---|---|---|
| **Storage Controller** | HP Smart Array P410i Controller | 1GB memory module with flash-backed write cache (FWBC). Supports RAID 0,1. |
| | NOTE: The HP Smart Array P410i controller is required for all blades that support hot plug drives. See Factory Integrated Models section for more information. | |
| **Maximum Internal Storage** One of the following depending on Model | Hot Plug SAS | 2TB SAS (2 x 1TB) Serial SCSI |
| | Hot Plug SATA | 2TB SATA (2 x 1TB) Serial ATA |
| | Hot Plug SATA SSD | 800GB SATA SSD (2 x 400GB) Serial ATA SSD |
| | Hot Plug SAS SSD | 1.6TB SAS SSD (2 x 800GB) Serial SCSI |
| | NOTE: SAS, SATA, and/or SSD drives cannot be mixed within the server. | |
| **Graphics** | Integrated ATI RN-50 1280 x 1024 x 16M color | |
| | Resolution Color Depths | Depths 1280 x 1024, 16.7M , 64k, 256,16<br>1024 x 768, 16.7M, 64k, 256, 16<br>800 x 600, 16.7M, 64k, 256, 16<br>640 x 480, 16.7M, 64k, 256, 16 |

**Fibre Channel Support**

Two (2) optional dual-port Fibre Channel HBAs are supported by the HP ProLiant BL465c G7. Each mezzanine circuit board connects directly to the server blade system board. These Fibre Channel HBAs are available via option kits and must be ordered separately.

HBA mezzanine card option kits:

Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 403621-B21)

- Field-proven reliability and performance for a broad range of applications using drivers and management tools that are fully compatible with all Emulex HBAs

Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 456972-B21)

- Exceptional performance, enhanced security, and scalable management for virtual server and enterprise-class applications

QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 403619-B21)

- Uses common drivers which means that customers can standardize on one QLogic driver whether they are using the QMH2462 or other HBAs powered by QLogic

QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem (PN 451871-B21)

- Provides a first step into the 8Gb future, advanced, embedded support for virtualized environments and reduced power consumption

HP BLc Brocade 804 8Gb Fibre Channel Host Bus Adapter (PN 590647-B21)

- Application oriented Quality of Service (AQoS) providing the ability to configure, prioritize, and optimize traffic flows from virtual machines and/or applications to the target port

*Standard Features*

Brocade, Emulex and QLogic Fibre Channel HBAs for HP BladeSystem c-Class feature:

- Optimal performance utilizing PCI Express
- 4/2/1Gb/s auto negotiating speeds (4Gb HBAs)
- 8/4/2Gb/s auto negotiation speeds (8Gb HBAs)
- Dual-ports for redundant path connections
- Up to two FC HBAs per server blade providing redundant FC HBA support
- Optimized for HP Storage products and supported by third party SAN vendors
- Support for Microsoft® Windows®, Linux, VMware ESX and Citrix XenServer™ operating system environments

**Compatible SAN**

HP ProLiant BL465c G7 server blades are optimized for HP MSA, EVA, and XP
HP ProLiant BL465c G7 server blades are compatible with select 3rd party SANs (please see blade storage page for more details: http://h18004.www1.hp.com/products/blades/components/c-class-sans.html)

**HP Virtual Connect**

HP Virtual Connect is an interconnect option for BladeSystem c-Class that simplifies server connectivity to data and storage networks, and reduces costs. Unique HP Flex-10 and FlexFabric technologies make maximum use of network bandwidths, provide dynamic tuning and enable extreme flexibility to meet individual server and infrastructure requirements. HP Virtual Connect Enterprise Manager (VCEM) provides a central console to administer network connections and workloads for thousands of servers. For more information on Virtual Connect Ethernet, Fibre Channel, Converged Network and management options see: www.hp.com/go/virtualconnect

**HP Insight management software**

HP Service Pack for ProLiant

HP Service Pack for ProLiant is an enhanced, re-packaging of ProLiant systems software and firmware, but is still based on the rich legacy of ProLiant Support Packs (PSPs) and HP Smart Update Firmware DVD that are originally found in the Insight Foundation suite for ProLiant. It is a comprehensive systems software and firmware release offered as a tested solution on all ProLiant servers supported by Insight Foundation version 8.70. It evolves beyond separate installation of HP PSPs and the HP Smart Update Firmware DVD by providing a single image that combines both of these products. It offers combined firmware and systems software packaging and improved processes for drivers, utilities, agents, non agents, and other utilities that are required to keep pace in today's rapidly expanding technology infrastructure.

Main or base releases for HP Service Pack for ProLiant are planned approximately 3 times a year, but look for interim update releases that will capture hot fixes released between main releases. HP Service Pack for ProLiant is supported on all HP ProLiant SL/ML/DL 100, 300, 500, 700, and 900 servers and BladeSystems series servers that are supported with Insight Foundation version 8.70 and will supersede and replace Insight Foundation. It is downloadable from: www.hp.com/go/server/service_packs/updates as a web only release and is not available on media.

The first release of HP Service Pack for ProLiant is Version 2011.06.0. It contains the first comprehensive collection of firmware and system software components, all tested together that include drivers, agents, non-agents,

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|---|---|
| | utilities, firmware packages for servers, controllers, storage, blades, enclosures, and all components and options supported by HP ProLiant Support Packs for Windows and Linux version 8.70. Additionally, VMware offline firmware updates will be included.<br><br>More information can be found at this link for HP Service Pack for ProLiant: www.hp.com/go/server/service_packs |
| HP Insight Foundation | Insight Foundation is being baselined at version v8.70 which means the following:<br><br>• Its Media Kit (contains 2 SmartStart CDs, the Firmware DVD, and the Management DVD) will continue to ship with all supported ProLiant G7 or earlier BTO servers until the last supported server is no longer shipping.<br>• The Media Kit will not be updated past version 8.70.<br>• ProLiant G7 or earlier CTO servers are able to order the Media Kit with the understanding that the media is not updated. Please check specific server QuickSpecs for availability of CTO Kit.<br>• PSP and Firmware DVD downloads will be updated through 2Q 2012 at the HP Insight Foundation Suite for ProLiant downloads tab: http://www.hp.com/go/foundation<br><br>Customers are urged to use the replacement product, HP Service Pack for ProLiant, instead of Insight Foundation Suite which is found at these location:<br><br>• www.hp.com/go/spp<br>• www.hp.com/go/spp/download |
| HP Integrated Lights-Out (iLO) | HP Integrated Lights-Out (iLO) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP iLO works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and Insight Dynamics for ProLiant, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service. For more information, visit: www.hp.com/go/iLO |
| HP Insight Control | HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console.<br><br>Two versions of Insight Control are available, to serve environments requiring either a Linux-based or a Windows-based central management server: HP Insight Control for Linux, and HP Insight Control. See www.hp.com/go/insightcontrol<br><br>HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight. |
| HP Insight Dynamics for ProLiant | HP Insight Dynamics for ProLiant, a product option, is advanced infrastructure management software that enables IT staff to instantly adjust |

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|---|---|---|
| | | their environments to meet dynamic business demands by provisioning, optimizing and protecting complex infrastructure in minutes. It's a powerful toolkit, integrated-by-design, that accelerates complex technology projects and simplifies daily operations, transforming data center economics. With Insight Dynamics IT professionals can plan capacity and power continuously, balance workloads across physical and virtual resources, and ensure cost-effective high availability. It also enables IT organizations to provision infrastructure consistently and automatically from pools of shared resources using a self-service portal. Resources provisioned can range from a single virtual machine to complex multi-tier environments and their associated physical and virtual resource requirements. In addition to the previous functional benefits, it also provides a cost-effective disaster recovery for physical and virtual environments that works with HP Continuous Access software for both the Enterprise Virtual Array and the XP storage array allowing application environments to be reactivated in minutes with the touch of a button to a remote location.<br><br>NOTE: For more information, visit:<br>http://www.hp.com/go/insightdynamics |
| High Performance Clusters | HP Cluster Platforms | HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and SUSE Linux Enterprise Server, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. http://www.hp.com/go/clusters |
| | HP HPC Interconnects | High Performance Computing (HPC) interconnect technologies are available for this server as part of the HP Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by HP when integrated within an HP cluster. Flexible, validated solutions can be defined with the help of configuration tools.<br>http://www.hp.com/techservers/clusters/ucp/index.html |
| | HP Insight Cluster Management Utility | HP Insight Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used for lifecycle management of hyperscale clusters of Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective.<br>http://www.hp.com/go/cmu |
| | HP HPC Linux Value Pack | HP HPC Linux Value Pack (Value Pack) is an HP-licensed and HP-supported option to HP Insight CMU, for the development and deployment of applications on HPC Cluster Platforms. Value Pack includes the Platform LSF workload scheduler and Platform Application Center, as well as the HP-MPI parallelization library. HP HPC Linux Value Pack |

*Standard Features*

**Operating Systems and Virtualization Software**

Microsoft Windows Server
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)
Solaris
VMware ESX
Citrix XenServer

NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, including how to purchase from HP, please visit our OS Support Site at: http://www.hp.com/go/ossupport.

**Availability**

Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection
Embedded dual-port 10Gb Converged Network Adapter for redundant LAN connections
Two (2) hot-plug SAS/SATA/SSD drive bays and integrated RAID (Smart Array P410i) controller with flash-backed write cache
Redundant ROM on each server blade
Multiple mezzanine I/O expansion
Advanced ECC Memory
Online memory spare
Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)

**Industry Standard Compliance**

ACPI 2.0 Compliant
PCI 2.2 Compliant
WOL Support
Microsoft® Logo certifications
USB 2.0 Support

**Security**

- Power-on password
- Administrator's password
- Integrated Lights-Out 3 with:
  - 12 customizable user accounts
  - SSL encryption
  - Secure Shell version 2
  - Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface
  - AES and RC4 encryption of video
  - Disable via a global setting
- Keyboard password
- External USB port enable/disable
- Network server mode
- Serial interface control
- TPM (Trusted Platform Module) 1.2 option

*Standard Features*

**Security - Trusted Platform Module**

The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline.

NOTE: For more information about TPM, including a white paper, go to: www.hp.com/go/TPM.
NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment.
NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.

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**Factory Express Portfolio for Servers and Storage**

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services on your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

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**HP Enterprise Configurator**

The HP eConfigure Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator.

Service and Support

HP Technology Services for Industry Standard Servers and BladeSystem
Capitalizing on HP ProLiant server and HP BladeSystem capabilities requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know HP infrastructure hardware and software best - the experienced professionals at HP Services.

What HP ProLiant and BladeSystem Services can do for you
HP ProLiant and BladeSystem Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. This way, HP proposes services solutions that include more than just uplift of base warranty. You can get the support you need by choosing from one of a number of service packaged solutions we have designed to address wider set of customer support needs.

HP Technology Services meets business challenges with services offered in three packages - Optimized Care Package, Standard Care Package, and Basic Care Package - available for each product group. Such packaged solutions enable customers to optimize technology operations, minimize risk and drive better business outcomes with easy-to-buy, easy-to-use scalable support packages for servers, storage, networking and software.

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Optimized Care Package

Supports maintaining servers at optimum performance availability

HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure
Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, RDP, PMP and VPM
http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW.pdf

3-Year HP Critical Advantage L3 for c3000/c7000 enclosure + 3-Year HP Critical Advantage L3 for Blade server
Provides end-to-end infrastructure support solution for business critical applications running on virtualized/x86 infrastructures, enabling the customers to cost effectively build, operate, and continuously improve their IT environment
http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-1772ENW.pdf

HP Installation and Startup Service for HP BladeSystem c-Class Enhanced Network
HP Provides for the configuration and testing of BladeSystem Ethernet interconnect switches to facilitate proper implementation of network protocols and access to advanced features.
http://h20195.www2.hp.com/V2/GetPDF.aspx/4aa0-5969ENW.pdf

Additional Services: Virtualization Services - Strategy, Design, Transition, Operation, Continual Service Improvement.

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*Service and Support*

| | |
|---|---|
| Standard Care Package | Package that maintains high level of server availability |

HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure
Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, RDP, PMP and VPM
http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW.pdf

HP Installation and Startup Service for HP BladeSystem c-Class Enhanced Network
HP Provides for the configuration and testing of BladeSystem Ethernet interconnect switches to facilitate proper implementation of network protocols and access to advanced features
http://h20195.www2.hp.com/V2/GetPDF.aspx/4aa0-5969ENW.pdf

3-Year, HP 6 hour Hardware Support Onsite Call-to-Repair Service for c3000/c7000 enclosure + 3-Year, HP 6 hour Hardware Support Onsite Call-to-Repair Service for Blade server
Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center
http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EN.pdf

3-Year , HP 24x7 Software Support for Insight Control
Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers
http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEE.pdf

1-Year HP Proactive Select 30 Credit
Provides a flexible way to purchase HP best-in-class consultancy and technical services
http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-3842ENN.pdf

Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up and Software Support); Microsoft or Linux or VMware education courses; +60 Proactive Select Credits, Factory Express.

*Service and Support*

| | |
|---|---|
| Basic Care Package | Delivers minimum recommended support service level<br><br>HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure for c3000/c7000 enclosure<br>Provides for the installation and startup of a BladeSystem c3000 Infrastructure in a single blade enclosure including hardware and software, including deployment of OS, HP SIM, RDP, RDP, PMP and VPM<br>http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW.pdf<br><br>3-Year, HP 24x7 4 hour Response, Hardware Support Onsite Service for c3000/c7000 enclosure + 3-Year, HP 24x7 4 hour Response, Hardware Support Onsite Service for Blade server<br>Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged<br>http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE.pdf<br><br>3-Year , HP 24x7 Software Support for Insight Control<br>Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers<br>http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEE.pdf<br><br>1-Year HP Proactive Select 10 Credit<br>Provides a flexible way to purchase HP best-in-class consultancy and technical services<br>http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-3842ENN.pdf<br><br>Additional Services: Startup Blade System c-Cass Enhanced Network Service; Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up and Software Support); +30 Proactive Select Credits, Factory Express |
| Insight Remote Support | The packages include HP Insight Remote Support that uses proven technology to deliver secure, reliable 24x7 remote monitoring, diagnoses, and problem resolution. It is available at no additional cost to all warranty, HP Care Pack Service, and service agreement customers. |
| For more information | To learn more on HP ProLiant servers and HP BladeSystem servers, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: www.hp.com/services/bladesystem |

## Sixteen-Core Models

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

| | | |
|---|---|---|
| HP ProLiant BL465c G7 6276 1P 8GB-R P410i/1GB FBWC Hot Plug SAS/SATA SFF Server 655086-B21 | Processor(s)<br>One of the following depending on Model | (1) AMD Opteron™ 6276 (2.30GHz/16-core/16MB/115W) Processor<br>(1) AMD Opteron™ 6272 (2.10GHz/16-core/16MB/115W) Processor |
| | Cache Memory<br>One of the following depending on Model | 8 x 2MB Level 2 cache memory<br>16 MB Level 3 cache memory |
| HP ProLiant BL465c G7 6272 1P 8GB-R P410i/1GB FBWC Hot Plug SAS/SATA SFF Server 655085-B21 | Memory | 8 GB (2 x 4 GB) PC3-10600, Registered DDR3-1333 |
| | Network Adapter | One (1) embedded HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter |
| | Storage Controller | Smart Array P410i RAID controller with 1 GB cache flash-backed write cache (FBWC) |
| | Hard Drives | None ships standard; (2) SFF SAS/SATA/SSD drive bays |
| | Internal Storage<br>One of the following depending on Model | Up to 2TB SAS<br>Up to 2TB SATA<br>Up to 800GB SATA SSD<br>Up to 1.6TB SAS SSD |
| | Optical Drive | None ships standard |
| | Form Factor | Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure<br>Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure |

## Twelve-Core Models

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

| | | |
|---|---|---|
| HP ProLiant BL465c G7 6238 1P 8GB-R P410i/1GB FBWC Hot Plug SAS/SATA SFF Server 655087-B21 | Processor(s)<br>One of the following depending on Model | (1) AMD Opteron™ 6238 (2.60GHz/12-core/16MB/115W) Processor<br>(1) AMD Opteron™ 6176 (2.3GHz/12-core/16MB/115) Processor<br>(1) AMD Opteron™ 6174 (2.2 GHz/12-core/12MB/115W) Processor<br>(1) AMD Opteron™ 6172 (2.2GHz/12-core/12MB/115W) Processor |
| HP ProLiant BL465c G7 6176 1P 8GB-R P410i/1GB FBWC 2 SFF Server 632982-B21 | Cache Memory<br>One of the following depending on Model | 6200: 8x2MB Level 2 cache memory 6100; 16 MB Level 3 cache memory 6100<br>6100::12 MB Level 3 cache memory; 512 KB Level 2 cache memory per core |
| | Memory | 8 GB (2 x 4 GB) PC3-10600, Registered DDR3-1333 |
| | Network Adapter | One (1) embedded HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter |
| HP ProLiant BL465c G7 6174 1P 8GB-R P410i/1GB FBWC Hot | Storage Controller | Smart Array P410i RAID controller with 1 GB cache flash-backed write cache (FBWC) |
| | Hard Drives | None ships standard; (2) SFF SAS/SATA/SSD drive bays |

*Models*

| | | |
|---|---|---|
| Plug 2 SFF Server<br>518859-B21 | Internal Storage<br>One of the following depending on Model | Up to 2TB SAS<br>Up to 2TB SATA<br>Up to 800GB SATA SSD<br>Up to 1.6TB SAS SSD |
| HP ProLiant BL465c G7 6172 1P 8GB-R P410i/1GB FBWC Hot Plug 2 SFF Server<br>518851-B21 | Optical Drive | None ships standard |
| | Form Factor | Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure<br>Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure |

## Eight-Core Models

| | | |
|---|---|---|
| HP ProLiant BL465c G7 6132HE 1P 8GB-R P410i/1GB FBWC 2 SFF Server<br>632985-B21 | Processor(s)<br>One of the following depending on Model | (1) Low Power AMD Opteron™ 6132HE(2.2GHz/8-core/12MB/85W) Processor<br>(1) AMD Opteron™ 6136 (2.4GHz/8-core/12MB/115W) Processor<br>(1) Low Power AMD Opteron™ 6128HE (2.0GHz/8-core/12MB/85W) Processor |
| HP ProLiant BL465c G7 6136 1P 8GB-R P410i/1GB FBWC Hot Plug 2 SFF Server<br>518854-B21 | Cache Memory<br>One of the following depending on Model | 512 KB Level 2 cache memory per core<br>12 MB Level 3 cache memory |
| | Memory | 8 GB (2 x 4 GB) PC3-10600, Registered DDR3-1333 |
| | Network Adapter | One (1) embedded HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter |
| HP ProLiant BL465c G7 6128HE 1P 8GB-R P410i/1GB FBWC Hot Plug 2 SFF Server<br>518867-B21 | Storage Controller | Smart Array P410i RAID controller with 1 GB cache flash-backed write cache (FBWC) |
| | Hard Drives | None ships standard; (2) SFF SAS/SATA/SSD drive bays |
| | Internal Storage<br>One of the following depending on Model | Up to 2TB SAS<br>Up to 2TB SATA<br>Up to 800GB SATA SSD<br>Up to 1.6TB SAS SSD |
| | Optical Drive | None ships standard |
| | Form Factor | Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure<br>Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure |

*Smart Buys*

| | | |
|---|---|---|
| HP BL465c G7 6134 4 GB Svr/S-Buy<br>630443-S01 | Processor(s) | AMD Opteron processor Model 6134 (2.3 GHz, 12 MB L3 Cache, 80W ACP) |
| | Memory | 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 |
| | Network Adapter | One (1) embedded HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter |
| | Storage Controller | Smart Array P410i RAID controller with 1 GB cache flash-backed write cache (FBWC) |
| | Hard Drives | None ships standard; (2) SFF SAS/SATA/SSD drive bays |
| | Internal Storage | Up to 1.2TB SAS<br>Up to 1TB SATA<br>Up to 240GB SATA SSD |
| | Optical Drive | None ships standard |
| | Form Factor | Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure<br>Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure |
| HP BL465c G7 6176 2P 16 GB Svr/S-Buy<br>644341-S01 | Processor(s) | (2) AMD Opteron™ 6176 (2.3GHz/12-core/12MB/80W) |
| | Memory | 16 GB (4 x 4 GB) PC3-10600, Registered DDR3-1333 |
| | Network Adapter | One (1) embedded HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter |
| | Storage Controller | Smart Array P410i RAID controller with 1 GB cache flash-backed write cache (FBWC) |
| | Hard Drives | None ships standard; (2) SFF SAS/SATA/SSD drive bays |
| | Internal Storage | Up to 1.2TB SAS<br>Up to 1TB SATA<br>Up to 240GB SATA SSD |
| | Optical Drive | None ships standard |
| | Form Factor | Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure<br>Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure |

*Smart Buys*

| | | |
|---|---|---|
| HP BL465c G7 6272 2P 48 GB Svr/S-Buy 663063-S01 | Processor(s) | (2)AMD Opteron 6272 (2.1GHz/16-core/16MB/115W TDP) Processor |
| | Memory | 48GB (6x8GB) Dual Rank x4 PC3-10600 Registered DDR3-1333 |
| | Network Adapter | (1) integrated HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter (1) additional 10/100 server adapter dedicated to iLO 3 management |
| | Storage Controller | Smart Array P410i RAID controller with 1 GB cache flash-backed write cache (FBWC) |
| | Hard Drives | None ships standard; (2) SFF SAS/SATA/SSD drive bays |
| | Internal Storage | Up to 2TB SAS<br>Up to 2TB SATA<br>Up to 800GB SATA SSD<br>Up to 1.6TB SAS SSD |
| | Optical Drive | None ships standard |
| | Form Factor | Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure<br>Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure |

| | | |
|---|---|---|
| HP BL465c G7 6220 2P 32 GB Svr/S-Buy 663064-S01 | Processor(s) | (2)AMD Opteron 6220 (3.0GHz/8-core/16MB/115W) Processor |
| | Memory | 32GB (4x8GB) Dual Rank x4 PC3-10600 Registered DDR3-1333 |
| | Network Adapter | (1) integrated HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter (1) additional 10/100 server adapter dedicated to iLO 3 management |
| | Storage Controller | Smart Array P410i RAID controller with 1 GB cache flash-backed write cache (FBWC) |
| | Hard Drives | None ships standard; (2) SFF SAS/SATA/SSD drive bays |
| | Internal Storage | Up to 2TB SAS<br>Up to 2TB SATA<br>Up to 800GB SATA SSD<br>Up to 1.6TB SAS SSD |
| | Optical Drive | None ships standard |
| | Form Factor | Up to eight (8) half-height blades supported in the HP BladeSystem c3000 Enclosure<br>Up to sixteen (16) half-height blades supported in HP BladeSystem c7000 Enclosure |

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.
NOTE: HP does not allow factory integration of options into standard models listed above.
Configure-to-order servers must start with a CTO Chassis.
NOTE: FIO indicates that this option is a Factory Installable Option.

## Step 1: Base Server Blade Configuration

| | | |
|---|---|---|
| HP Models | HP ProLiant BL465c G7 Configure-to-order Server | 518857-B21 |
| | Configurable Model ships with: | |
| | One (1) integrated HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter and one (1) additional 10/100 server adapter dedicated to iLO 3 management | |
| | Two (2) small form factor (SFF) SAS/SATA/SSD hot plug drive bays | |
| | HP Integrated Lights-Out 3 (iLO 3) | |

## Step 2: Choose Required Options (one of the following from each list unless otherwise noted)

| | | |
|---|---|---|
| HP Processors | For single (1) processor configuration choose (one of the following):<br>NOTE: If two (2) processors are desired, select one xxxxxx-L21 and one xxxxxx-B21. | |
| | Sixteen-Core Processors | |
| | HP BL465c G7 AMD Opteron™ 6276 (2.30GHz/16-core/16MB/115W) FIO Processor Kit | 655093-L21 |
| | HP BL465c G7 AMD Opteron™ 6274 (2.20GHz/16-core/16MB/115W) FIO Processor Kit | 655091-L21 |
| | HP BL465c G7 AMD Opteron™ 6272 (2.10GHz/16-core/16MB/115W) FIO Processor Kit | 655090-L21 |
| | HP BL465c G7 AMD Opteron™ 6262HE (1.60GHz/16-core/16MB/85W) FIO Processor Kit | 655096-L21 |
| | Twelve-Core Processors | |
| | HP BL465c G7 AMD Opteron™ 6238 (2.60GHz/12-core/16MB/115W) FIO Processor Kit | 655094-L21 |
| | HP BL465c G7 AMD Opteron™ 6234 (2.40GHz/12-core/16MB/115W) FIO Processor Kit | 655092-L21 |
| | HP BL465c G7 AMD Opteron™ 6176 (2.3GHz/12-core/12MB/115W) FIO Processor Kit | 632983-L21 |
| | HP BL465c G7 AMD Opteron™ 6174 (2.2GHz/12-core/12MB/115W) FIO Processor Kit | 518860-L21 |
| | HP BL465c G7 AMD Opteron™ 6172 (2.10GHz/12-core/12MB/115W) FIO Processor Kit | 518852-L21 |
| | HP BL465c G7 AMD Opteron™ 6166HE (1.8GHz/12-core/12MB/85W) FIO Processor Kit | 632991-L21 |
| | HP BL465c G7 AMD Opteron™ 6164HE (1.7GHz/12-core/12MB/85W) FIO Processor Kit | 596207-L21 |
| | Eight-Core Processors | |

| | | |
|---|---|---|
| | HP BL465c G7 AMD Opteron™ 6220 (3.0GHz/8-core/16MB/115W) FIO Processor Kit | 655095-L21 |
| | HP BL465c G7 AMD Opteron™ 6212 (2.60GHz/8-core/16MB/115W) FIO Processor Kit | 655089-L21 |
| | HP BL465c G7 AMD Opteron™ 6140 (2.6GHz/8-core/12MB/115W) FIO Processor Kit | 632989-L21 |
| | HP BL465c G7 AMD Opteron™ 6136 (2.4GHz/8-core/12MB/115W) FIO Processor Kit | 518855-L21 |
| | HP BL465c G7 AMD Opteron™ 6134 (2.3GHz/8-core/12MB/115W) FIO Processor Kit | 518863-L21 |
| | HP BL465c G7 AMD Opteron™ 6132HE (2.2GHz/8-core/12MB/85W) FIO Processor Kit | 632986-L21 |
| | HP BL465c G7 AMD Opteron™ 6128HE (2.0GHz/8-core/12MB/85W) FIO Processor Kit | 518868-L21 |
| | Four-Core Processors | |
| | HP BL465c G7 AMD Opteron™ 6204 (3.30GHz/4-core/16MB/115W) FIO Processor Kit | 672513-L21 |
| HP Memory | Registered DIMMs (RDIMMs) | |
| | HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593907-B21 |
| | HP 4GB (1x4GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit | 676331-B21 |
| | HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593911-B21 |
| | HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit | 604500-B21 |
| | HP 8GB (1x8GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit | 676333-B21 |
| | HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593913-B21 |
| | HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit | 604502-B21 |
| | HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit | 593915-B21 |
| | HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit | 627808-B21 |
| | HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit | 684066-B21 |
| | HP 32GB (1x32GB) Quad Rank x4 PC3L-8500 (DDR3-1066) Registered CAS-7 LP Memory Kit | 627810-B21 |
| | Unbuffered with ECC DIMMs (UDIMMs) | |
| | HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit | 593921-B21 |
| | HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit | 593923-B21 |

NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator

NOTE: A minimum of two (2) DIMMs per processor are required.

NOTE: Kits described as PC3L include Low Voltage DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

NOTE: Each processor memory bus will operate at up to 1600 MHz with two single-rank or dual-rank (SR/DR) DIMMs per processor memory channel, up to 1333 MHz with either one quad-rank (QR) or two single-rank/dual-rank (SR/DR) DIMMs per processor memory channel, and 1066 MHz with up to two QR or one QR and one SR/DR DIMMs per processor memory channel with standard voltage (1.5V, PC3) DIMMs. Memory bus will operate one speed slower when low voltage (1.35V, PC3L) memory is installed. Memory bus speeds may be further limited by the speed of the memory used as well.

## Step 3: Choose Additional Options for Factory Integration

| | | |
|---|---|---|
| HP Storage Controller | HP Smart Array P410i/1G FBWC 2-ports Int PCIe x8 SAS Controller<br>NOTE: Includes 1 GB cache with flash-backed write cache (FBWC).<br>NOTE: The Smart Array P410i controller is required for all blades that support hot plug drives. | 588184-B22 |

NOTE: For additional Core Options and Additional Options please see options sections below. For additional options, including server blade enclosures interconnect and mezzanine options and power subsystem options; please see the following:
HP BladeSystem c3000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12790_na/12790_na.html
HP BladeSystem c7000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12810_na/12810_na.html
and HP BladeSystem c-Class Interconnect and Mezzanine Components:
http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html
http://h18004.www1.hp.com/products/blades/components/c-class-adapters.html

*Core Options*

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

| | | |
|---|---|---|
| HP Ethernet Mezzanine Options | Gigabit Ethernet Mezzanines | |
| | HP NC325m PCI Express Quad Port Gigabit Server Adapter<br>NOTE: If the NC325m is installed in mezzanine slot 1 of a half-height server, connectivity will be provided on only 2 of the 4 ports. | 416585-B21 |
| | HP NC360m Dual Port 1GbE BL-c Adapter | 445978-B21 |
| | HP NC364m Quad Port 1GbE BL-c Adapter<br>NOTE: If the NC364m is installed in mezzanine slot 1 of a half-height server, connectivity will be provided on only 2 of the 4 ports. | 447883-B21 |
| | HP NC382m PCI Express Dual Port Multifunction Gigabit Server Adapter | 453246-B21 |
| | 10 Gigabit Ethernet Mezzanines | |
| | NOTE: A 10 Gigabit Ethernet adapter is required for each server blade connecting to a 10Gb interconnect in bays 3-8 (HP BladeSystem c7000 Enclosure) or bays 2-4 (HP BladeSystem c3000 Enclosure).<br>NOTE: Each 10 Gigabit Ethernet adapter requires a minimum of 2GB of server memory.<br>NOTE: Each 10 Gigabit Either adapter supports linking at 1000Mbps or 10000Mbps when not connected to a Flex-10 enabled module and will link with all current 1Gb switches at 1Gb.<br>NOTE: The ROM Based Setup Utility (RBSU) feature allows for the configuring of a FlexFabric Adapter to any of the supported protocols. For example iSCSI to FCoE (Fibre Channel over Ethernet). Note that a HP Virtual Connect profile takes precedence over the setting in this menu. Also, some FlexFabric Adapters may require that network boot be enabled in order to configure the protocol. If the protocol is configured without enabling network boot with certain FlexFabric Adapters, the protocol may not take effect. Once the protocol has taken effect on the first boot after configuring this option, network boot may be disabled if desired. | |
| | HP NC532m Dual Port 10GbE Multifunction BL-c Adapter | 467799-B21 |
| | HP NC542m Dual Port Flex-10 10GbE BL-c Adapter | 539857-B21 |
| | HP NC550m 10Gb 2-port PCIe x8 Flex-10 Ethernet Adapter | 581204-B21 |
| | HP BLc NC551m Dual Port FlexFabric 10Gb Converged Network Adapter | 580151-B21 |
| | HP NC552m 10Gb 2-port Flex-10 Ethernet Adapter | 610609-B21 |
| | HP NC553m 10Gb 2-port FlexFabric Adapter | 613431-B21 |
| HP Fibre Channel Mezzanine Options | 4Gb Fibre Channel Mezzanines | |
| | Emulex LPe1105 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem | 403621-B21 |
| | QLogic QMH2462 4Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem | 403619-B21 |
| | 8Gb Fibre Channel Mezzanines | |
| | Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem | 456972-B21 |
| | QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem | 451871-B21 |
| | HP BLc Brocade 804 8Gb Fibre Channel Host Bus Adapter | 590647-B21 |

## Core Options

| | | |
|---|---|---|
| HP Processors | Sixteen-Core Processors | |
| | HP BL465c G7 AMD Opteron™ 6276 (2.30GHz/16-core/16MB/115W) Processor Kit | 655093-B21 |
| | HP BL465c G7 AMD Opteron™ 6274 (2.20GHz/16-core/16MB/115W) Processor Kit | 655091-B21 |
| | HP BL465c G7 AMD Opteron™ 6272 (2.10GHz/16-core/16MB/115W) Processor Kit | 655090-B21 |
| | HP BL465c G7 AMD Opteron™ 6262HE (1.60GHz/16-core/16MB/85W) Processor Kit | 655096-B21 |
| | Twelve-Core Processors | |
| | HP BL465c G7 AMD Opteron™ 6238 (2.60GHz/12-core/16MB/115W) Processor Kit | 655094-B21 |
| | HP BL465c G7 AMD Opteron™ 6234 (2.40GHz/12-core/16MB/115W) Processor Kit | 655092-B21 |
| | HP BL465c G7 AMD Opteron™ 6176 (2.3GHz/12-core/12MB/115W) Processor Kit | 632983-B21 |
| | HP BL465c G7 AMD Opteron™ 6174 (2.2GHz/12-core/12MB/115W) Processor Kit | 518860-B21 |
| | HP BL465c G7 AMD Opteron™ 6172 (2.1GHz/12-core/12MB/115W) Processor Kit | 518852-B21 |
| | HP BL465c G7 AMD Opteron™ 6166HE (1.8GHz/12-core/12MB/85W) Processor Kit | 632991-B21 |
| | HP BL465c G7 AMD Opteron™ 6164HE (1.7GHz/12-core/12MB/85W) Processor Kit | 596207-B21 |
| | Eight-Core Processors | |
| | HP BL465c G7 AMD Opteron™ 6220 (3.0GHz/8-core/16MB/115W) Processor Kit | 655095-B21 |
| | HP BL465c G7 AMD Opteron™ 6212 (2.60GHz/8-core/16MB/115W) Processor Kit | 655089-B21 |
| | HP BL465c G7 AMD Opteron™ 6140 (2.6GHz/8-core/12MB/115W) Processor Kit | 632989-B21 |
| | HP BL465c G7 AMD Opteron™ 6136 (2.4GHz/8-core/12MB/115W) Processor Kit | 518855-B21 |
| | HP BL465c G7 AMD Opteron™ 6134 (2.3GHz/8-core/12MB/115W) Processor Kit | 518863-B21 |
| | HP BL465c G7 AMD Opteron™ 6132HE (2.2GHz/8-core/12MB/85W) Processor Kit | 632986-B21 |
| | HP BL465c G7 AMD Opteron™ 6128HE (2.0GHz/8-core/12MB/85W) Processor Kit | 518868-B21 |
| | Four-Core Processors | |
| | HP BL465c G7 AMD Opteron™ 6204 (3.30GHz/4-core/16MB/115W) Processor Kit | 672513-B21 |
| | NOTE: HP ProLiant BL465c G7 processor option kits contain one (1) processor. | |

| | | |
|---|---|---|
| HP Memory | Registered DIMMs (RDIMMs) | |
| | HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593907-B21 |
| | HP S-Buy 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593907-S21 |
| | HP 4GB (1x4GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit | 676331-B21 |
| | HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593911-B21 |

| | |
|---|---|
| HP S-Buy 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593911-S21 |
| HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit | 604500-B21 |
| HP 8GB (1x8GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit | 676333-B21 |
| HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593913-B21 |
| HP S-Buy 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593913-S21 |
| HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit | 604502-B21 |
| HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit | 593915-B21 |
| HP S-Buy 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit | 593915-S21 |
| HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit | 627808-B21 |
| HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit | 684066-B21 |
| HP 32GB (1x32GB) Quad Rank x4 PC3L-8500 (DDR3-1066) Registered CAS-7 LP Memory Kit | 627810-B21 |
| Unbuffered with ECC DIMMs (UDIMMs) | |
| HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit | 593921-B21 |
| HP S-Buy 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit | 593921-S21 |
| HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit | 593923-B21 |

NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator.

NOTE: A minimum of two (2) DIMMs per processor are required.

NOTE: Kits described as PC3L include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

NOTE: Each processor memory bus will operate at up to 1600 MHz with two single-rank or dual-rank (SR/DR) DIMMs per processor memory channel, up to 1333 MHz with either one quad-rank (QR) or two single-rank/dual-rank (SR/DR) DIMMs per processor memory channel, and 1066 MHz with up to two QR or one QR and one SR/DR DIMMs per processor memory channel with standard voltage (1.5V, PC3) DIMMs. Memory bus will operate one speed slower when low voltage (1.35V, PC3L) memory is installed. Memory bus speeds may be further limited by the speed of the memory used as well.

HP Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or

the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

NOTE: SAS, SATA, and/or SSD drives cannot be mixed within the server.

SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

| | |
|---|---|
| HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 619291-B21 |
| HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive S-Buy | 619291-S21 |
| HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 581286-B21 |
| HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive S-Buy | 581286-S21 |
| HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 581284-B21 |
| HP 300GB 6G SAS 15K rpm SFF (2.5-inch) Hot Plug Enterprise 3 yr Warranty Hard Drive | 627117-B21 |
| HP 300GB 6G SAS 15K rpm SFF (2.5-inch) Hot Plug Enterprise 3 yr Warranty Hard Drive S-Buy | 627117-S21 |
| HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 507127-B21 |
| HP S-Buy 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 507127-S21 |
| HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 512547-B21 |
| HP S-Buy 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 512547-S21 |
| HP S-Buy 146GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 507125-S21 |
| HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive | 512545-B21 |

NOTE: Please see the for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html

SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

| | |
|---|---|
| HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive | 605835-B21 |
| HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive S-Buy | 605835-S21 |
| HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive | 507610-B21 |

SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives

| | |
|---|---|
| HP 1TB 3G SATA 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive | 625609-B21 |
| HP 1TB 3G SATA 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive S-Buy | 625609-S21 |
| HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive | 507750-B21 |
| HP S-Buy 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive | 507750-S21 |

| | |
|---|---|
| **6G SAS Hot Plug Enterprise Performance Solid State Drives** | |
| HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive | 632494-B21 |
| HP 200GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive | 632492-B21 |
| HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive | 632494-B21 |
| **6G SAS Hot Plug Enterprise Mainstream Solid State Drives** | |
| HP 200GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive | 632502-B21 |
| HP 400GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive | 632504-B21 |
| HP 800GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive | 632506-B21 |
| NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14038_na/14038_na.html | |
| **SATA Hot Plug 2.5" Enterprise Mainstream Solid State Drives** | |
| HP 400GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive | 636597-B21 |
| HP 200GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive | 636595-B21 |
| HP 100GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive | 636593-B21 |
| NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13415_na/13415_na.html | |

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

| | | |
|---|---|---|
| HP Insight Software | HP Insight Control | |
| | HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License | T9074BAE |
| | HP Smart Buy Insight Control suite, No Media, Electronic License including 1 year of 24x7 Technical Support and Updates | T9074ASE |
| | HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License | 452148-B22 |
| | HP S-Buy Insight Control, Single-Server License including 1 year of 24x7 Technical Support and Updates | 452148-S22 |
| | HP Insight Management Media Kit<br>NOTE: HP Insight Management Media Kit contains DVDs without licenses. Contains HP Systems Insight Manager, HP Insight Control, HP Matrix Operating Environment, and Virtual Connect Enterprise Manager software. Uses an integrated installer to perform quick and accurate software installation and updates.<br>NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.<br>NOTE: Customer will receive a license entitlement certificate. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.<br>NOTE: Licenses ship without media. The HP Insight Management Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates.<br>NOTE: Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.<br>NOTE: For additional license kits please see the Insight Control QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12631_na/12631_na.html | 436222-B21 |
| | HP Insight Control for Linux | |
| | HP Insight Control for Linux including 1yr 24x7 Support Electronic License | TC213AAE |
| | HP Smart Buy Insight Control for Linux, 1-server license, including one year of 24x7 Technical Support and Updates, Electronic | TC213ASE |
| | HP Insight Control for Linux including 1yr 24x7 Support Single Server License | TC209A |
| | HP Insight Control for Linux Media Kit<br>NOTE: Media pack DVD contains the ISO image for HP Insight Control for Linux, HP Systems Insight Manager, HP Insight Control power management, HP Insight Control virtual machine management, and an integrated installer. Servers must be acquired separately.<br>NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/ic-linux (click on Download button).<br>NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys.<br>NOTE: For additional License Kits, including electronic licensing options, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_na/13019_na.html | TC208A |

| | | |
|---|---|---|
| | **HP iLO Advanced for BladeSystem** | |
| | HP iLO Advanced for BladeSystem including 1yr 24x7 Support Electronic License | TA851AAE |
| | HP iLO Advanced for BladeSystem including 1yr 24x7 Support Single Server License | 512488-B21 |
| | NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates.<br>NOTE: Electronic licenses can be used to purchase multiple licenses with a single activation key.<br>NOTE: Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.<br>NOTE: For additional license kits, including electronic delivery options, please see the HP Integrated Lights-Out (iLO) QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12362_na/12362_na.html | |
| | **HP Insight Control server deployment** | |
| | HP Insight Control Server Deployment including 1yr 24x7 Support Electronic License | T9082AAE |
| | HP Insight Control Server Deployment including 1yr 24x7 Support Single Server License | 452151-B21 |
| | NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates.<br>NOTE: Electronic licenses can be used to purchase multiple licenses with a single activation key.<br>NOTE: Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.<br>NOTE: For additional license kits please see the Insight Control QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12631_na/12631_na.html | |
| **High Performance Clusters** | HP Cluster Management Utility Flexible License<br>NOTE: This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.<br>NOTE: For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12612_na/12612_na.html | QL803A |
| | HP Cluster Management Utility Media<br>NOTE: Order a minimum of one license per cluster to purchase media including software and documentation, which will be delivered to the customer, and also licenses CMU management. No license key is delivered or required.<br>NOTE: For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12612_na/12612_na.html | 433257-B21 |
| | HP High Performance Computing Linux Value Pack 1 Processor Flexible License<br>NOTE: This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one socket (a.k.a. processor). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.<br>NOTE: For additional license kits please see the QuickSpecs at: | TC293B |

*Additional Options*

| | | |
|---|---|---|
| | http://h18004.www1.hp.com/products/quickspecs/13485_na/13485_na.html | |
| | HP High Performance Computing Linux Value Pack Media Kit<br>NOTE: This part number can be used to purchase media including software and documentation, which will be delivered to the customer.<br>NOTE: For additional license kits please see the QuickSpecs at:<br>http://h18004.www1.hp.com/products/quickspecs/13485_na/13485_na.html | TC294A |
| HP Security | HP Trusted Platform Module Option<br>NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss. | 488069-B21 |
| HP Storage Controller | **HP Smart Array P712m Controller** | |
| | HP Smart Array P712m/256 6Gb 2-ports Int/2-ports Ext Mezzanine SAS Controller | 488348-B21 |
| | **HP Smart Array P711m Controller** | |
| | HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller | 513778-B21 |
| | **HP Smart Array P700m Controller** | |
| | HP Smart Array P700m/512 4-ports Ext PCIe x8 SAS Controller | 508226-B21 |
| | HP Smart Array P700m/256 4-ports Ext PCIe x8 SAS Controller | 507925-B21 |
| | NOTE: Supports all HP ProLiant Server Blades, except the HP ProLiant BL2x220c and BL685c G7 server blades.<br>NOTE: Please see the QuickSpecs for Technical Specifications and additional information:<br>http://h18000.www1.hp.com/products/quickspecs/13175_na/13175_na.html | |
| | **Optional Upgrades** | |
| | HP Smart Array P-Series Low Profile Battery<br>NOTE: The BL465c G7 supports a maximum of one array controller battery. If one Smart Array P700m controller with cache battery kit is ordered for factory integration, the internal Smart Array P410i cache module capacitor will be removed and shipped with the server for customer installation. | 452348-B21 |
| | HP Smart Array Advanced Pack including 1yr 24x7 Technical Support and Updates Single Server License<br>NOTE: A license key, a minimum of 256MB cache, and battery kit is required to enable Smart Array Advanced Pack features. For more information go to:<br>http://www.hp.com/go/saap | 516471-B21 |
| HP I/O Expansion Options | HP 640GB IO Accelerator for BladeSystem c-Class | BK836A |
| | HP 320GB IO Accelerator for BladeSystem c-Class | AJ878B |
| | NOTE: Please see the QuickSpecs for Technical Specifications and additional information:<br>http://h18000.www1.hp.com/products/quickspecs/13220_na/13220_na.html | |

*Additional Options*

| | | |
|---|---|---|
| **HP InfiniBand Mezzanine Options** | HP 4X QDR QLogic InfiniBand Dual Port Mezzanine HCA for c-Class BladeSystem | 583210-B21 |
| | HP 4X QDR InfiniBand ConnectX-2 Dual Port Mezzanine HCA for c-Class BladeSystem | 592519-B21 |
| | NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12586_na/12586_na.html | |
| **HP Ultrium Tape Blades** | HP LTO-4 SB1760c Tape Blade | AQ697A |
| | NOTE: LTO-4 Ultrium technology | |
| | NOTE: Please see the QuickSpecs for Technical Specifications and additional configuration information at: http://h18000.www1.hp.com/products/quickspecs/12729_na/12729_na.html | |
| | NOTE: Please visit the BladeSystem c-Class enclosure QuickSpecs for a complete list of recommended data protection solutions for BladeSystem c-Class enclosures: http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/index.html. | |
| **HP Storage Blades** | HP LTO-5 SB3000c Tape Blade | BS580A |
| | NOTE: Please see the for Technical Specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/12729_na/12729_na.html | |
| | HP D2200sb Storage Blade | AP880A |
| | NOTE: Please see the HP D2200sb PCIe Storage Blade QuickSpecs for technical specifications and additional information at: http://h18006.www1.hp.com/storage/bladesystem/index.html. | |
| **HP Expansion Blade** | HP BLc PCI Expansion Blade | 448018-B21 |
| | NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation. | |
| | NOTE: Please see the QuickSpecs Technical Specifications and additional configuration information at: http://h18000.www1.hp.com/products/quickspecs/12753_na/12753_na.html | |
| **HP USB and SD Options** | HP USB 2-Button Optical Scroll Mouse | DC172B |
| | HP USB Standard Keyboard | DT528A#ABA |
| | HP 2GB USB Flash Media Drive Key Kit | 608447-B21 |
| | NOTE: HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software like SmartStart. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to HP VMware Getting Started Guide for installation instructions. | |
| | HP 4GB Micro SDHC Flash Media Kit | 647444-B21 |

*Additional Options*

| | | |
|---|---|---|
| HP Care Pack Services | NOTE: The HP Care Pack service part numbers below for ProLiant BL c-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server. | |
| | Hardware Services On-site Service | |
| | HP 3 year 4 hour 13x5 BL4xxc Server Blade Hardware Support | UK065E |
| | HP 3 year 4 hour 24x7 BL4xxc Server Blade Hardware Support | UK066E |
| | HP 3 year 6 hour 24x7 Call to Repair BL4xxc Server Blade Hardware Support | UK067E |
| Smart Buy Care Pack Services | S-Buy 4-Hour Onsite Response, 13-Hour x 5-Day Coverage, 3 years | UH959E |
| | S-Buy 4-Hour Onsite Response, 24-Hour x 7-Day Coverage, 3 years | UH960E |
| | S-Buy 6-Hour Call to Repair, 24-Hour x 7-Day Coverage, 3 years | UM366E |
| | S-Buy 3 year 24x7 Call to Repair TRBL 4xxc Server Blade Hardware Support | HZ765E |
| | NOTE: Smart Buy Care Packs can only be attached to Smart Buy SKUs | |

*Memory*

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

DDR3 Memory Population Guidelines

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator

Some DIMM installation guidelines are summarized below:

- For the HP ProLiant BL465c G7 server blade with sixteen (16) memory slots:
  - There are four (4) channels per processor; eight (8) channels per server
  - There are two (2) DIMM slots for each memory channel; sixteen (16) total slots.
  - Memory channel 1 consists of the two (2) DIMMs that are furthest from the processor
  - Memory channel 4 consists of the two (2) DIMMs that are closest from the processor
- A minimum of two (2) DIMMs per processor are required
- DIMM slots that are white should be populated first
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs)
- Do not install DIMMs if the corresponding processor is not installed
- If only one (1) processor is installed in a two (2) CPU system, only half of the DIMM slots are available
- To maximize performance, balance the total memory capacity between all installed processors
- To maximize performance, balance the total memory capacity on any given processor across the memory channels
- You may only have up to eight (8) ranks installed per channel
- You may install up to two (2) quad-rank DIMMs per channel
- If mixing DIMM voltage is a requirement, please note that the DIMMs will run at 1.5V since all 1.35V are capable of supporting 1.5V operations
- When running virtualization software, a minimum of two (2) DIMMs per processor are required. Populate DIMM sockets 1A and 5B for each processor socket populated.

| DIMM slot/capacity/populated speed table | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DIMM Type | Registered DIMMS (RDIMMs) | | | | | | | | | Unbuffered with ECC DIMMs (UDIMMs) | |
| DIMM Rank | Single Rank (1R) | | | Dual Rank (2R) | | | | Quad Rank (4R) | | Dual Rank (2R) | |
| DIMM Capacity | 4GB | 4GB | 8GB | 2GB | 8GB | 16GB | 16GB | 16GB | 32GB | 2GB | 4GB |
| DIMM Native Speed (MHz) | 1333 | 1600 | 1600 | 1333 | 1333 | 1333 | 1600 | 1066 | 1066 | 1333 | 1333 |
| DIMM Voltage | LV/Std | Std | Std | Std | LV/Std | LV/Std | Std | Std | LV/Std | Std | Std |
| SLOTS THAT CAN BE POPULATED | | | | | | | | | | | |
| 16 slot servers | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| MAXIMUM CAPACITY (GB) | | | | | | | | | | | |
| 16 slot servers | 64 | 64 | 128 | 32 | 128 | 256 | 256 | 256 | 512 | 32 | 64 |
| POPULATED DIMM SPEED (MHz) | | | | | | | | | | | |
| 1 DIMM Per Channel | 1333 | 1600 | 1600 | 1333 | 1333 | 1333 | 1600 | 1066 | 1066 | 1333 | 1333 |
| 2 DIMM Per Channel | 1333 | 1600 | 1600 | 1333 | 1333 | 1333 | 1600 | 1066 | 1066/800* | 1333 | 1333 |
| * 3DPC: LV runs at 800/Std voltage runs at 1066 | | | | | | | | | | | |

NOTES:

- PC3-10600 DIMMs have a maximum speed of 1333MHz. PC3-8500 DIMMs have a maximum speed of 1066MHz.
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, the maximum speed will be 1066MHz

*Memory*

- If you install 1x 1066MHz DIMM in channel 1 and 7x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, the maximum speed will be 1066MHz
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

HP ProLiant BL465 G7 Server Blade DIMM slot and configuration diagrams

Basic memory slot and population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.

| 16 DIMM SLOTS (8 per CPU node) | | | | | |
|---|---|---|---|---|---|
| | CPU1 | | CPU2 | | |
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | A | 1 | A | Chnl 1 |
| | 2 | E | 2 | E | |
| | | | | | |
| Chnl 2 | 3 | C | 3 | C | Chnl 2 |
| | 4 | G | 4 | G | |
| | | | | | |
| Chnl 3 | 5 | B | 5 | B | Chnl 3 |
| | 6 | F | 6 | F | |
| | | | | | |
| Chnl 4 | 7 | D | 7 | D | Chnl 4 |
| | 8 | H | 8 | H | |

HP ProLiant BL465c G7 Server Blade (1P Model)

Standard memory configuration (1 CPU model)

- 8GB, consisting of two (2) 4GB single-rank PC3-10600 RDIMMs

| | CPU1 | | CPU2 | | |
|---|---|---|---|---|---|
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | A: 4GB DIMM | 1 | A: empty | Chnl 1 |
| | 2 | E: empty | 2 | E: empty | |
| | | | | | |
| Chnl 2 | 3 | C: empty | 3 | C: empty | Chnl 2 |
| | 4 | G: empty | 4 | G: empty | |
| | | | | | |
| Chnl 3 | 5 | B: 4GB DIMM | 5 | B: empty | Chnl 3 |
| | 6 | F: empty | 6 | F: empty | |
| | | | | | |
| Chnl 4 | 7 | D: empty | 7 | D: empty | Chnl 4 |
| | 8 | H: empty | 8 | H: empty | |

Standard Memory Plus Optional Memory (1 CPU model)

- 104GB, consisting of two (2) 4GB RDIMMs plus six (6) 16GB RDIMMs
  - 2 x 4GB single-rank PC3-10600 RDIMMs
  - 6 x 16GB quad-rank PC3-8500 RDIMMs

*Memory*

| | CPU1 | | CPU2 | | |
|---|---|---|---|---|---|
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | A: 4GB DIMM | 1 | A: empty | Chnl 1 |
| | 2 | E: 16GB DIMM | 2 | E: empty | |
| | | | | | |
| Chnl 2 | 3 | C: 16GB DIMM | 3 | C: empty | Chnl 2 |
| | 4 | G: 16GB DIMM | 4 | G: empty | |
| | | | | | |
| Chnl 3 | 5 | B: 4GB DIMM | 5 | B: empty | Chnl 3 |
| | 6 | F: 16GB DIMM | 6 | F: empty | |
| | | | | | |
| Chnl 4 | 7 | D: 16GB DIMM | 7 | D: empty | Chnl 4 |
| | 8 | H: 16GB DIMM | 8 | H: empty | |

Standard Memory Replaced with Optional Memory (1 CPU model)

- 128GB, consisting of eight (8) 16GB quad-rank PC3-8500 RDIMMs

| | CPU1 | | CPU2 | | |
|---|---|---|---|---|---|
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | A: 16GB DIMM | 1 | A: empty | Chnl 1 |
| | 2 | E: 16GB DIMM | 2 | E: empty | |
| | | | | | |
| Chnl 2 | 3 | C: 16GB DIMM | 3 | C: empty | Chnl 2 |
| | 4 | G: 16GB DIMM | 4 | G: empty | |
| | | | | | |
| Chnl 3 | 5 | B: 16GB DIMM | 5 | B: empty | Chnl 3 |
| | 6 | F: 16GB DIMM | 6 | F: empty | |
| | | | | | |
| Chnl 4 | 7 | D: 16GB DIMM | 7 | D: empty | Chnl 4 |
| | 8 | H: 16GB DIMM | 8 | H: empty | |

UDIMM maximum configuration (1 CPU model)

- 32GB, consisting of eight (8) 4GB dual-rank PC3-10600 UDIMMs

*Memory*

| | CPU1 | | CPU2 | | |
|---|---|---|---|---|---|
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | A: 4GB DIMM | 1 | A: empty | Chnl 1 |
| | 2 | E: 4GB DIMM | 2 | E: empty | |
| | | | | | |
| Chnl 2 | 3 | C: 4GB DIMM | 3 | C: empty | Chnl 2 |
| | 4 | G: 4GB DIMM | 4 | G: empty | |
| | | | | | |
| Chnl 3 | 5 | B: 4GB DIMM | 5 | B: empty | Chnl 3 |
| | 6 | F: 4GB DIMM | 6 | F: empty | |
| | | | | | |
| Chnl 4 | 7 | D: 4GB DIMM | 7 | D: empty | Chnl 4 |
| | 8 | H: 4GB DIMM | 8 | H: empty | |

Standard Memory Replaced with Optional Memory (2 CPU Model)
RDIMM maximum configuration

- 512GB, consisting of sixteen (16) 32GB quad-rank PC3L-8500 RDIMMs

| | CPU1 | | CPU2 | | |
|---|---|---|---|---|---|
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | A: 32GB DIMM | 1 | A: 32GB DIMM | Chnl 1 |
| | 2 | E: 32GB DIMM | 2 | E: 32GB DIMM | |
| | | | | | |
| Chnl 2 | 3 | C: 32GB DIMM | 3 | C: 32GB DIMM | Chnl 2 |
| | 4 | G: 32GB DIMM | 4 | G: 32GB DIMM | |
| | | | | | |
| Chnl 3 | 5 | B: 32GB DIMM | 5 | B: 32GB DIMM | Chnl 3 |
| | 6 | F: 32GB DIMM | 6 | F: 32GB DIMM | |
| | | | | | |
| Chnl 4 | 7 | D: 32GB DIMM | 7 | D: 32GB DIMM | Chnl 4 |
| | 8 | H: 32GB DIMM | 8 | H: 32GB DIMM | |

UDIMM maximum configuration (2 CPU model)

- 64GB, consisting of sixteen (16) 4GB dual-rank PC3-10600 UDIMMs

*Memory*

| | CPU1 | | CPU2 | | |
|---|---|---|---|---|---|
| | slot # | population order | slot # | population order | |
| Chnl 1 | 1 | A: 4GB DIMM | 1 | A: 4GB DIMM | Chnl 1 |
| | 2 | E: 4GB DIMM | 2 | E: 4GB DIMM | |
| | | | | | |
| Chnl 2 | 3 | C: 4GB DIMM | 3 | C: 4GB DIMM | Chnl 2 |
| | 4 | G: 4GB DIMM | 4 | G: 4GB DIMM | |
| | | | | | |
| Chnl 3 | 5 | B: 4GB DIMM | 5 | B: 4GB DIMM | Chnl 3 |
| | 6 | F: 4GB DIMM | 6 | F: 4GB DIMM | |
| | | | | | |
| Chnl 4 | 7 | D: 4GB DIMM | 7 | D: 4GB DIMM | Chnl 4 |
| | 8 | H: 4GB DIMM | 8 | H: 4GB DIMM | |

NOTE: Capacity references are rounded to the common Gigabyte values.

- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB
- 16GB = 16384MB

| | | |
|---|---|---|
| HP Memory | Registered DIMMs (RDIMMs) | |
| | HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593907-B21 |
| | HP 4GB (1x4GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit | 676331-B21 |
| | HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593911-B21 |
| | HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit | 604500-B21 |
| | HP 4GB (1x4GB) Single Rank x4 PC3-12800 (DDR3-1600) Registered CAS-11 Memory Kit | 676333-B21 |
| | HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit | 593913-B21 |
| | HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit | 604502-B21 |
| | HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit | 593915-B21 |
| | HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit | 627808-B21 |
| | HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit | 684066-B21 |
| | HP 32GB (1x32GB) Quad Rank x4 PC3L-8500 (DDR3-1066) Registered CAS-7 LP Memory Kit | 627810-B21 |
| | Unbuffered with ECC DIMMs (UDIMMs) | |

*Memory*

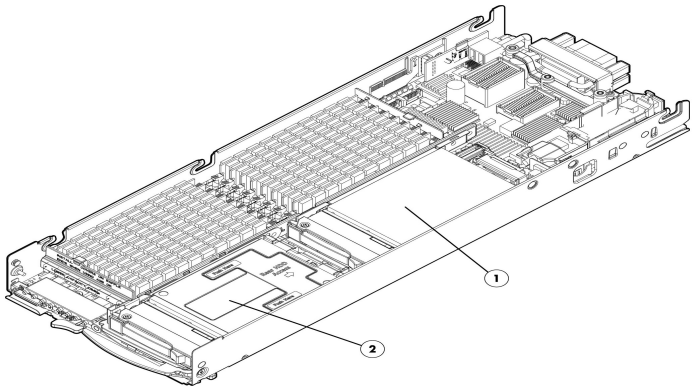
| | |
|---|---|
| HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit | 593921-B21 |
| HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit | 593923-B21 |

NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator

NOTE: A minimum of two (2) DIMMs per processor are required.

NOTE: Kits described as PC3L include Low Voltage DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

NOTE: Each processor memory bus will operate at up to 1600 MHz with two single-rank or dual-rank (SR/DR) DIMMs per processor memory channel, up to 1333 MHz with either one quad-rank (QR) or two single-rank/dual-rank (SR/DR) DIMMs per processor memory channel, and 1066 MHz with up to two QR or one QR and one SR/DR DIMMs per processor memory channel with standard voltage (1.5V, PC3) DIMMs. Memory bus will operate one speed slower when low voltage (1.35V, PC3L) memory is installed. Memory bus speeds may be further limited by the speed of the memory used as well.




1-2 2 x SFF SAS or SATA Hot Plug Hard Drives, or
2 x SFF SATA Hot Plug SSD Drives

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Simultaneous operation of hot plug hard drives and solid state drives is not supported.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

NOTE: SAS, SATA, and/or SSD drives cannot be mixed within the server.

SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

| | Quantity Supported | Position Supported | Controller |
|---|---|---|---|
| 900GB 6G SAS 10K<br>600GB 6G SAS 10K<br>450GB 6G SAS 10K<br>300GB 6G SAS 15K<br>300GB 6G SAS 10K<br>146GB 6G SAS 15K<br>72GB 6G SAS 15K | 2 | 1-2 | Smart Array P410i Controller |

SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

| | Quantity Supported | Position Supported | Controller |
|---|---|---|---|
| 1TB 6G SAS 7.2K<br>500GB 6G SAS 7.2K | 2 | 1-2 | Smart Array P410i Controller |

SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives

| | Quantity Supported | Position Supported | Controller |
|---|---|---|---|
| 1TB 3G SATA 7.2K<br>500GB 3G SATA 7.2K | 2 | 1-2 | Smart Array P410i Controller |

6G SAS Hot Plug Enterprise Performance Solid State Drives

*Storage*

| | Quantity Supported | Position Supported | Controller |
|---|---|---|---|
| 400GB 6G SAS SLC SFF<br>200GB 6G SAS SLC SFF | 2 | 1-2 | Smart Array P410i Controller |

6G SAS Hot Plug Enterprise Mainstream Solid State Drives

| | Quantity Supported | Position Supported | Controller |
|---|---|---|---|
| 800GB 6G SAS MLC SFF<br>400GB 6G SAS MLC SFF<br>200GB 6G SAS MLC SFF | 2 | 1-2 | Smart Array P410i Controller |

SATA Hot Plug 2.5" Enterprise Mainstream Solid State Drives

| | Quantity Supported | Position Supported | Controller |
|---|---|---|---|
| 400GB 3G SATA MLC SFF<br>200GB 3G SATA MLC SFF<br>100GB 3G SATA MLC SFF | 2 | 1-2 | Smart Array P410i Controller |

| | | | |
|---|---|---|---|
| System Unit | Dimensions (H x W x D) | 7.154 x 2.19 x 20.058 in (18.17 x 5.56 x 50.95 cm) | |
| | Weight (approximate) | Maximum (all hard drives, DIMMs, and processors installed) | 13.9 lb (6.3 kg) |
| | | Minimum (no hard drives, two DIMMs, and one processor installed) | 9.8 lb (4.45 kg) |
| | Power Specifications | For power specifications including Input Requirements, BTU Rating, and Power Supply Output, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL:<br>HP BladeSystem c3000 Enclosure QuickSpecs:<br>http://h18000.www1.hp.com/products/quickspecs/12790_na/12790_na.html<br>HP BladeSystem c7000 Enclosure QuickSpecs:<br>http://h18000.www1.hp.com/products/quickspecs/12810_na/12810_na.html<br><br>To review typical system power ratings use the HP Power Advisor which is available via the online tool located at: www.hp.com/go/hppoweradvisor<br><br>NOTE: For optimal cooling and system performance the BL465c G7 requires the c7000 enclosure to be configured with 10 fans and the c3000 enclosure to be configured with 6 fans. | |
| | System Inlet Temperature | Operating | 10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault, or above 30°C (86°F). |
| | | Non-operating | -30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr). |
| | Relative Humidity (non-condensing) | Operating | 10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing. |
| | | Non-operating | 5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing. |
| | Altitude | Operating | 3050 m (10,000 ft). This value may be limited by the type and number of options installed. |
| | | Non-operating | Maximum allowable altitude change rate is 457 m/min (1500 ft/min). |
| | Acoustic Noise | For acoustic noise specifications, please see the HP BladeSystem c-Class Enclosures QuickSpecs located at URL: | |

HP BladeSystem c3000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12790_na/12790_na.html
HP BladeSystem c7000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12810_na/12810_na.html

| | | |
|---|---|---|
| HP Smart Array P410i Controller | Disk Drive and Enclosure Interface | 6G SAS (Serial Attached SCSI)<br>3.0 G SATA (Serial Advanced Technology Attachment) |
| | SAS Connectors | 2 internal (SFF8484) x4 wide port connectors |
| | Cache Memory Speed | DDR2-533MHz with 40 or 72-bit wide bus provides up to 4.2 GB/s maximum bandwidth. |
| | Server Interface | x4 5G PCIe Gen2 provides 2 GB/s maximum bandwidth. |
| | SAS Speed | x2 6G SAS provides 1.2 GB/s maximum bandwidth. |
| | Cache Memory | 72-bit 1GB cache; ECC protection, capacitor-backed |
| | Logical Drives Supported | Up to 32 logical drives |
| | Maximum Logical Drive Capacity | 2 TB (2 x 1 TB) |
| | Host Memory Addressing | 64-bit, supporting greater than 4 GB server memory space |
| | RAID Support | RAID 1 (Mirroring)<br>RAID 0 (Striping) |
| | Upgradeable Firmware | Upgradeable Firmware with recovery ROM feature |

| | | |
|---|---|---|
| Integrated HP NC551i Dual Port FlexFabric 10Gb Converged Network Adapter | Type | Integrated dual-port KR 10GbE with FlexFabric (FCoE or iSCSI) capability |
| | Network Processor | Blade Engines 2 (BE2) |
| | Data Transfer Method | x8 PCI Express 2.0 |
| | Network Transfer Rate | Two ports, each at 20 Gbps full duplex; 40 Gbps aggregate full duplex theoretical bandwidth<br>NOTE: Each port is autosensing 1 Gb / 10 Gb, and can interoperate with 1 Gb HP BladeSystem c-Class interconnect components. Both ports will operate at the same speed.<br>NOTE: Each port on the NC551i adapter transmits from the server at 20 Gbps (theoretical) full duplex. |
| | IEEE Compliance | 802.1p QoS, 802.1Q VLAN tagging, 802.3ad link aggregation, 802.3ap 10GBase-KR, and 802.3x flow control |
| | Standard Features | • ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing<br>• 9K Jumbo frames (4K Jumbo frames when in FCoE mode)<br>• Microsoft Windows Receive Side Scaling (RSS)<br>• Accelerated FCoE or iSCSI |

*Technical Specifications*

| | | |
|---|---|---|
| HP Integrated Lights-Out 3 (iLO 3) integrated on system board | Architecture | PCI Express based health and remote management ASIC |
| | Processor | PCI Express RISC processor core running at 250MHz |
| | Upgradeability | Option firmware upgradeable via Flash ROM |
| | Video Support | 1600 x 1200 DVR max resolution |
| | Interfaces | One Ethernet network connection (10/100Mb/s) |
| | Memory | 128-MB DDR with ECC |
| | Operating System Support | Microsoft Windows 2008 R2 |
| | | Microsoft Windows 2008 (32 bit and 64 bit) |
| | | Microsoft Windows Server 2008 Standard Edition (32bit and 64bit) |
| | | Microsoft Windows Server 2008 Enterprise Edition (32bit and 64bit) |
| | | Microsoft Windows Server 2003 and Windows Server 2003 R2, and Windows Server 2003 for Extended Systems Standard Edition, Enterprise Edition |
| | | Red Hat Enterprise Linux 5.4 (32 bit and 64 bit) |
| | | SUSE LINUX Enterprise Server 11 (32bit and 64bit) |
| | | SUSE LINUX Enterprise Server 10 (32bit and 64bit) |
| | | VMware ESX 4.0 |
| | | VMware ESX 3.5.0 |
| | Client System Support | Microsoft Windows 7 |
| | | Microsoft Windows XP Professional Edition |
| | | Microsoft Windows Vista Business and Ultimate Editions |
| | | Red Hat Enterprise Desktop 5.00 |
| | | SUSE Linux Enterprise Desktop 11 |
| | | SUSE Linux Enterprise Desktop 10 |
| | Client Browser Support | Microsoft Internet Explorer 8 |
| | | Microsoft Internet Explorer 7 |
| | | Microsoft Internet Explorer 6 |
| | | Firefox 3.5 (on supported Windows and Linux systems) |
| | | Firefox 3.0 (on supported Windows and Linux systems) |
| | Command Line Support | Secure Shell and serial port access |
| | | Secure Socket Layer |
| | | Secure Shell version 2 |
| | Security | Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface |
| | | AES encryption of video |
| | | RC4 encryption of video |
| | Directory Support Services | Active Directory v1.0 (Windows 2003) |
| | Driver Support | HP ProLiant iLO3 Management Controller Driver Package |
| | Management protocols supported | SNMP, IPMI 2.0 (system and LAN interface), DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP), HP RIBCL XML |

| | | |
|---|---|---|
| Environment-friendly Products and Approach | End-of-life Management and Recycling | Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.<br><br>The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment. |

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.